

# **Escapees Co-Op of Nevada**

## **Water Conservation Plan**

**July 23, 2010**

### **Prepared for:**

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## **Introduction**

The water supply in Nevada is a precious commodity and plays an important role in determining Nevada's future. Nevada is the one of the driest states in the nation as well as one of the fastest growing ones. Nevada's future, both from an economic and a quality of life view, depends heavily upon the wise management of the water supply.

Groundwater, in general, provides about 40 percent of the total water supply used in Nevada. In some areas, groundwater provides the entire water supply. Groundwater usage may vary considerably from year-to-year as it is sometimes pumped to supplement surface water sources.

Water use in Nevada can be classified as:

- Domestic (household, both indoor and outdoor) – Met by public supply or private supply (e.g. wells).
- Commercial (businesses) – Met by public supply or private supply (e.g. non-community systems).
- Industrial (manufacturing/construction) – Met by public supply or private supply (e.g. non-community systems).
- Thermoelectric (electric/fossil fuel/geothermal power generation) – Met by public supply in a minor fraction.
- Mining (mining processes) – Supply source varies widely from operation to operation and is dependent upon the mineral being recovered and the recovery process employed.
- Irrigation (land use) – Met by self-supplied or supplied by irrigation companies or districts.
- Livestock (farm needs) – Supply source varies.

While all classifications of water usages have shown an increase over the years, it has historically been irrigation water use which has accounted for the majority of the water use in Nevada.

It has been estimated that the domestic water use accounts for less than 15 percent of the water used in Nevada, but this is expected to rise to nearly 25 percent as the population increases (based upon existing water use patterns and conservation measures). It is expected that Nevada's population will become increasingly concentrated in its primary urban areas of Las Vegas (Clark County), Reno/Sparks (Washoe County) and Carson City, with varied spillover effects on neighboring counties.

It is vitally important that all residents understand the fundamental science of water, how it is managed in the state, and the issues affecting its management. Water education must become a priority and must include education of children as they are our future.

Because Nevada does not have a comprehensive state-wide conservation program, it is reliant upon the individual water suppliers for developing their own conservation programs. In 1991,

Nevada enacted a law requiring adoption of conservations plans by water suppliers. Minimum standards for plumbing fixtures were adopted in 1991 (Assembly Bill 359) by Nevada and in 1992 minimum flow standards for plumbing fixtures were adopted by the federal government (National Energy and Policy Conservation Act).

Conservation is an essential part of ensuring adequate water supply as it is no longer feasible to develop new sources. It has proven to be a cost-effective way to reduce demands and/or to extend a given water supply. It can easily be pursued by all water users regardless of the water system type. Key to evaluating the program's effectiveness is the water use measurement (through meters and other measurement devices). Various conservation measures can be put into place and the achievement of the goals set with these measures is vital to combating the expected increase in water usage.

## **Statutory Requirements**

This water conservation plan was prepared for the Escapees Co-Op of Nevada in accordance with Nevada Revised Statute (NRS) 540. As outlined in NRS 540.141, the provisions of this plan must include:

- a. Public Education
- b. Conservation Measures
- c. Water Management
- d. Contingency Plan
- e. Schedule
- f. Evaluation Measurements
- g. Conservation Estimates

In addition to the provisions of the water conservation plan, listed above, NRS 540.141 also requires a rate analysis to be performed and included with the submittal.

This plan is being submitted to the Nevada Department of Conservation and Natural Resources (DCNR), Division of Water Resources (DWR) for review and approval prior to its adoption by the Escapees Co-Op of Nevada, as required by NRS 540.131.

This plan is available for inspection during normal business hours at the Escapees Co-Op of Nevada's business office, 5150 S. Oakridge, Unit #2, Pahrump, NV as well as on the Escapees Co-Op of Nevada's website at [www.skp-nv.org](http://www.skp-nv.org).

This plan will conform to all public notice requirements as found in NRS 540.

This is the original Water Conservation Plan for the Escapees Co-Op of Nevada.

In accordance with NRS 540.131, this plan will be reviewed from time-to-time to reflect changes and must be updated every five (5) years to comply with NRS 540.131 and NRS 540.141. The next update of this plan is to be on, or before, July 23, 2015.

## **System Description**

The Escapees Co-Op of Nevada is a privately-owned combined community water system and has a current water operation permit, NV0002552. Water is provided to users of a membership-only RV Park (182 pull-thru spaces and a clubhouse) on approximately 30 acres of flat land. The spaces are not individually metered for water usage. The Escapees Co-Op of Nevada is located at 5150 S. Oakridge, Pahrump, NV, which is located in Nye County. The Escapees Co-Op of Nevada is not a water company, in the business of selling water to customers, and as such does not have any water customers.

The estimated population provided water service in 2009 was 200 individuals. The Escapees Co-Op of Nevada estimates that its member base will not increase on a yearly basis through 2020 as the RV Park has been built out. The State of Nevada, through its State Water Plan, estimates the population growth for Nye County through 2020 to be 2.74% annually.

The water supply is from groundwater that is not under the direct influence of surface water (e.g. protected wells) and no surface water or groundwater under the influence of surface water sources. The water supply is which is located within the Pahrump Valley Basin (#162) of the Central Region Hydrographic Region (#10). There are a total of two (2) wells supplying the system and a total of one (1) hydro-pneumatic pressure tanks (2,000 gallons). Each of the wells is identified in the table below (Table 1).

**Table 1 – Source of Supply**

<b>Well No.</b>	<b>Depth (feet)</b>	<b>Production (gpm)</b>
<b>1</b>	<b>168</b>	<b>30</b>
<b>3</b>	<b>400</b>	<b>40</b>

The Escapees Co-Op of Nevada has been granted water rights in the total amount of 25.86 AF (8.42 MG) per year. Applications #53785 and #53939 have been certified and #74092 has been permitted. The combined duty under all applications shall not exceed 25.86 AF (8.42 MG) per year. The current water rights are listed in the table below (Table 2).

**Table 2 – Water Rights**

<b>Permit No. (Certificate No.)</b>	<b>Well No.</b>	<b>Rate of Diversion</b>	<b>Annual Use</b>
<b>53785 (16109)</b>	<b>1</b>	<b>0.239 c.f.s.</b>	<b>13.14 AF (4.282 MG)</b>
<b>53939 (16110)</b>	<b>1</b>	<b>0.239 c.f.s.</b>	<b>12.69 AF (4.135 MG)</b>
<b>74092</b>	<b>3</b>	<b>0.007 c.f.s.</b>	<b>2.00 AF (0.651 MG)</b>

Water is pumped from the wells and is injected with chlorine prior to going on the storage tank. Water is then distributed to the members through 2-inch mainlines.

The Escapees Co-Op of Nevada requires, at a minimum, a Grade 1 Water Operator. Water operator services are currently contracted out to Mr. Thomas Vehe (Water Rock Environmental) who possesses a Grade 3 Distribution Water Operator license.

The water operator is required to perform monthly and yearly monitoring and testing of water quality. The Escapees Co-Op of Nevada does not have any outstanding water quality issues.

The last sanitary survey performed by the Nevada Department of Environmental Protection (NDEP) was completed on August 6, 2008, and shows no deficiencies with the system.

The Escapees Co-Op of Nevada is a self-supplied water system and does not currently meter individual spaces for water use. Only members of the Escapees RV Club (non-profit organization) are allowed to utilize the Escapees Co-Op of Nevada and are allowed to rent spaces at the RV Park, if available (Escapees Co-Op of Nevada members put their lots into a rental pool while they travel). Operating expenses of the Escapees Co-Op of Nevada are shared equally upon all its members in the form of an annual maintenance fee. Because there are no water customers, a tiered rate usage fee is not applicable.

Wastewater collected from the service area is handled on-site by community septic tanks.

Member maintenance fees are reviewed annually and adjusted accordingly. The current fees are \$175/quarter or \$700/year. The last adjustment for the fees was on January 1, 2010.

## **Plan Provisions**

In accordance with NRS 540.131, this plan will be reviewed from time-to-time to reflect changes and must be updated every five (5) years to comply with NRS 540.131 and NRS 540.141. The next update of this plan is to be on, or before, July 23, 2015.

The Escapees Co-Op of Nevada will appoint a staff member, if economically feasible, to oversee the conservation efforts and this staff member will be responsible for implementation of

conservation programs, monitoring of water use, and will review /revise the conservation plan when needed.

In an effort to promote voluntary conservation and aid in Nevada's future, the Escapees Co-Op of Nevada will enact the voluntary conservation measures found in the ***Conservation Measures*** section. When more stringent measures are needed, the Escapees Co-Op of Nevada will enact the measures found in the ***Contingency Measures*** section. All measures can be found in Appendix A.

As required by NRS 540.141, the water conservation plan must include the following provisions:

- a. Public Education
- b. Conservation Measures
- c. Water Management
- d. Contingency Plan
- e. Schedule
- f. Evaluation Measures
- g. Conservation Estimates

Each provision is discussed below.

### **Public Education**

Public education is a key for cooperation with conservation efforts, so funding for public education is crucial. The Escapees Co-Op of Nevada recognizes this and will establish a conservation education program and corresponding budget, if economically feasible.

It is the goal of the Escapees Co-Op of Nevada to increase public awareness to conserve water, encourage reduction in lawn sizes, encourage the use of climate-appropriate plants, encourage the use of drip irrigation, and encourage conscious decisions for water use for not only its own members but for the general public.

The conservation education program includes education materials such as bill inserts, pamphlets, flyers, and posters. New members will be provided these materials when residence is established, while existing members will receive these materials periodically. Educational pamphlets will be provided to all members upon request and should include an explanation of all costs involved in supplying drinking water and demonstrate how the water conservation practices will provide water users with long-term savings. Education materials should also encourage reduction of lawn sizes, use of drip irrigation, use of climate-appropriate plants, and conservation tips and techniques (see Appendix B).

The Escapees Co-Op of Nevada could also establish a water conservation advisory committee that would involve its membership in the conservation process and provide feedback to the system concerning its efforts, thus fostering support for conservation in the community.

## Conservation Measures

In an effort to promote conservation and voluntarily conserve water, the Escapees Co-Op of Nevada is adopting water-use regulations to promote water conservation during non-emergency situations. These regulations include the following non-essential water use:

- 1) Use of water through any connection when the Escapees Co-Op of Nevada has notified the member in writing to repair a broken or defective plumbing, sprinkler, watering or irrigation system and the member has failed to make such repairs within 2 days after receipt of such notice.
- 2) Use of water which results in flooding or run-off in gutters, waterways, patios, driveway, or streets.
- 3) Use of water for washing aircraft, cars, buses, boats, trailers or other vehicles without a positive shut-off nozzle on the outlet end of the hose.
- 4) Use of water through a hose for washing buildings, structures, sidewalks, walkways, driveways, patios, or other hard-surfaced areas in a manner which results in excessive run-off or waste.
- 5) Use of water for more than minimal landscaping in connection with any new construction.
- 6) Use of water for outside plants, lawn, landscape, and turf areas are prohibited between the hours of 10 a.m. to 4 p.m.
- 7) Use of water for watering outside plants and turf areas using a hand-held hose without a positive shut-off valve.
- 8) Use of water for decorative fountains or the filling or topping off of decorative lakes or ponds. Exceptions are made for those decorative fountains, lakes, or ponds which utilize recycled water.
- 9) Use of water for the filling or refilling of swimming pools.

In the event these conservation measures are insufficient to control the water shortage, the Escapees Co-Op of Nevada may wish to implement the mandatory measures discussed in the ***Contingency Plan*** section below.

The Escapees Co-Op of Nevada also promotes the development of water conserving principles into the planning, development, and management of new landscape projects. Members are encouraged to consult with the local nursery or perform an internet search on the availability of water conservation plants and how to renovate existing landscapes. Members are also encouraged to evaluate irrigation management systems using metering, timing, and water sensing devices.

At present, it is not viable to offer any water conservation incentives. The issue of water conservation incentives will be addressed in future water conservation plans.



## **Water Management**

The Escapees Co-Op of Nevada does not regularly monitor/record water levels at all the well and tank sites. Total water use is recorded at each well and is reviewed quarterly.

There are no inter-ties with other local water purveyors to ensure adequate water supplies are available. Local well experts are available, if needed to address ensuring adequate water supplies are available.

The Escapees Co-Op of Nevada does not monitor unaccounted for water losses because members are not metered and there is no comparison to be made between production and member usage. The Escapees Co-Op of Nevada does not plan to install individual water meters on each of the RV spaces to allow it to monitor production verses usage figures.

The Escapees Co-Op of Nevada does not have a formal leak detection program. All leaks are repaired immediately upon discovery.

The Escapees Co-Op of Nevada does not experience pressure differences within their system. The system is on flat terrain.

The Escapees Co-Op of Nevada does not have a formal well head protection program. All well houses are well kept and are secured.

Because the Escapees Co-Op of Nevada does not meter usage, a meter replacement program for all meters that are not registering properly is not applicable.

A capital improvement plan is in place, is currently being funded through the annual maintenance fees, and water facilities are replaced when necessary.

The Escapees Co-Op of Nevada does not have a system for reusing of effluent. Effluent is treated on-site at community septic tanks.

## **Contingency Plan**

The objective of the contingency plan would be to manage the available resources to ensure continued supply of potable water during periods of drought or extended drought.

It is envisioned that voluntary conservation will be sufficient to ensure an adequate supply of water and reduce water usage. However, if a sustained drought (lack of precipitation) is encountered, it may be necessary to implement mandatory restrictions in order to ensure an adequate supply of water to meet essential needs.

The Escapees Co-Op of Nevada plans for drought response would be three (3) stages of drought response: (1) warning stage, (2) alert stage, and (3) emergency stage. The stages are describes as follows:

In Stage 1, the warning stage, the Escapees Co-Op of Nevada would increase monitoring of its water supplies and would begin creating public awareness of the water supply situation and the need to conserve. Conservation measures at this stage would be voluntary. Retrofit kits (low-flow faucet aerators, low-flow showerheads, leak detection tablets, and replacement flapper valves) can be made available, or at cost, and can be actively distributed, if needed.

In Stage 2, the alert stage, the Escapees Co-Op of Nevada would call for wide-based community support to achieve conservation, implement water use restrictions, and impose penalties for ignoring the restrictions. Conservation measures at this stage would be mandatory and violations would incur fines.

In Stage 3, the emergency stage, the Escapees Co-Op of Nevada would declare a drought and water shortage emergency, would enforce water use restrictions, impose fines for violations, and could impose fees for water usage. Media relations would be activated in order to inform the members and monetary assistance may need to be secured in an effort to mitigate the effects of the drought (e.g. federal funding assistance). Conservation measures at this stage would be mandatory and members could pay additional fees for water usage.

When a drought is declared over, voluntary conservation measures (see *Conservation Measures* section) will be reinstated and water supplies would continue to be monitored.

## **Schedule**

All of the provisions listed will be in place after the approval of this plan.

## **Evaluation Measurements**

Because individual RV spaces are not currently metered, it is impossible to determine the effectiveness of each plan element on an individual member basis. However, the Escapees Co-Op of Nevada can evaluate the effectiveness of each plan element from the perspective of the whole RV Park. In that regard, as a plan element is activated (e.g. mailing literature or declaring a drought stage), production figures will be compared to same-month historical data to estimate the plan element's effectiveness. This information will be utilized as a basis for any future water conservation plan revision and plan elements.

If there is a decrease in production as a result of a particular measure/incentive, that measure/incentive can be expanded or improved upon, if possible. If it is discovered that a particular measure/incentive is ineffective, it will be discontinued and a new one can then be implemented to take its place. In addition to changes resulting from audits, updates, and

modifications to conservation measures/incentives there will be changes made to meet changing conditions (e.g. member growth and demand, changing use, new technologies, etc.).

## **Conservation Estimates**

It is estimated that metering alone will be the major driver of conservation, by raising awareness of individual usage. Metering alone, without a rate structure change, but with the public education elements, can be expected to provide a 10% reduction in water use.

During the Stage 1 phase of the conservation plan, it is estimated that conservation measures could be expected to provide a 2.5 to 5% reduction in water use.

During the Stage 2 phase of the conservation plan, it is estimated that conservation measures could be expected to provide a 5 to 7.5% reduction in water use.

During the Stage 3 phase of the conservation plan, it is estimated that conservation measures could be expected to provide a 7.5 to 30% reduction in water use.

The estimated water savings for various end-user efforts can be found in Appendix C.

## **Rate Analysis**

The Escapees Co-Op of Nevada is not a water company, in the business of selling water to customers, and as such does not have paying water customers. A rate analysis is not applicable in this case.

## **Appendices**

## **APPENDIX A**

### **CONSERVATION MEASURES**

## **Stage 1 – Warning Stage**

1. The Escapees Co-Op of Nevada would increase monitoring of water supplies.
2. The Escapees Co-Op of Nevada would begin creating public awareness of the water supply situation and the need to conserve.
3. The Escapees Co-Op of Nevada would inform members of voluntary conservation measures (non-essential water uses, listed below).
4. The Escapees Co-Op of Nevada would provide members with retrofit kits either at cost or free.

Non-essential water uses are:

- 1) Use of water through any connection when the Escapees Co-Op of Nevada has notified the member in writing to repair a broken or defective plumbing, sprinkler, watering or irrigation system and the member has failed to make such repairs within 2 days after receipt of such notice.
- 2) Use of water which results in flooding or run-off in gutters, waterways, patios, driveway, or streets.
- 3) Use of water for washing aircraft, cars, buses, boats, trailers or other vehicles without a positive shut-off nozzle on the outlet end of the hose.
- 4) Use of water through a hose for washing buildings, structures, sidewalks, walkways, driveways, patios, or other hard-surfaced areas in a manner which results in excessive run-off or waste.
- 5) Use of water for more than minimal landscaping in connection with any new construction.
- 6) Use of water for outside plants, lawn, landscape, and turf areas are prohibited between the hours of 10 a.m. to 4 p.m.
- 7) Use of water for watering outside plants and turf areas using a hand-held hose without a positive shut-off valve.
- 8) Use of water for decorative fountains or the filling or topping off of decorative lakes or ponds. Exceptions are made for those decorative fountains, lakes, or ponds which utilize recycled water.
- 9) Use of water for the filling or refilling of swimming pools.

## **Stage 2 – Alert Stage**

1. The Escapees Co-Op of Nevada would set conservation goals and call for wide-based community support to achieve those goals.
2. The Escapees Co-Op of Nevada would inform members of mandatory conservation measures (non-essential water uses, listed in Stage 1 are now mandatory).
3. The Escapees Co-Op of Nevada would inform members of penalties if mandatory conservation measures are not observed (penalties are listed below).
4. The Escapees Co-Op of Nevada would inform members of mandatory conservation water fees.
5. The Escapees Co-Op of Nevada would provide members with retrofit kits either at cost or free.

Penalties for violation of mandatory conservation measures are:

- 1<sup>st</sup> violation – written warning.
- 2<sup>nd</sup> violation – \$25.00
- 3<sup>rd</sup> violation – \$50.00
- 4<sup>th</sup> violation – \$100.00

Offenses for separate water use restriction violations will each start at the warning stage (1<sup>st</sup> violation) and the penalties for the offenses are in addition to the space rental charges.

Stage 2 water rates would include an additional monthly water usage fee of \$25.00, or other such fee as deemed necessary.

### **Stage 3 – Emergency Stage**

1. The Escapees Co-Op of Nevada would declare a drought and water shortage emergency and use media relations to supplement efforts to keep members informed.
2. The Escapees Co-Op of Nevada would inform members of prohibited water uses (non-essential water uses, listed in Stage 1 are now prohibited).
3. The Escapees Co-Op of Nevada would inform members of penalties if prohibited measures are not observed (penalties are listed below).
4. The Escapees Co-Op of Nevada would provide members with retrofit kits either at cost or free.
5. The Escapees Co-Op of Nevada would seek monetary assistance in an effort to mitigate the drought (e.g. federal funding).

Penalties for violation of prohibited water use measures are:

1<sup>st</sup> violation – written warning.

2<sup>nd</sup> violation – \$100.00

3<sup>rd</sup> violation – take the necessary legal action to protect existing water sources.

Offenses for separate water use restriction violations will each start at the warning stage (1<sup>st</sup> violation) and the penalties for the offenses are in addition to the space rental charges.

Stage 3 water rates would include an additional monthly water usage fee of \$50.00, or other such fee as deemed necessary.

If any member seeks a variance from the provisions of Stage 3, then that member shall notify the Escapees Co-Op of Nevada in writing, explaining in detail the reason for such a variation. The Escapees Co-Op of Nevada shall respond to each request.



**APPENDIX B**  
**PUBLIC EDUCATION MATERIALS**

There are several publications available for use at U.S. EPA website for general distribution (currently located at <http://epa.gov/watersense/pubs/index.htm#ideas>). These publications include such topics as:

- Simple Steps to Save Water,
- Ideas for Residences,
- Ideas for Commercial,
- Using Water Wisely In the Home,
- Outdoor Water Use in the US,
- Toilet Flush Facts,
- Watering Can Be Efficient,
- Irrigation Timers for the Homeowner, and
- Water Efficient Landscaping,

These publications can be utilized until the Escapees Co-Op of Nevada develops system-specific publications.

There are also numerous website that provide tips for conserving water. One of these is: <http://www.wateruseitwisely.com/100-ways-to-conserve/index.php>. Members can be directed to this website for tips to conserve water.

Specific tips for landscaping that can be provided to the members are listed below. During drought conditions outdoor watering restrictions may be imposed, and therefore some of the following tips will not apply.

## **Tips for Landscaping**

### **Watering:**

- Detect and repair all leaks in irrigation systems.
- Use properly treated wastewater for irrigation where available.
- Water the lawn or garden during the coolest part of the day (early morning is best). Do not water on windy days.
- Water trees and shrubs, which have deep root systems, longer and less frequently than shallow-rooted plants which require smaller amounts of water more often. Check with the local nursery for advice on the amount and frequency of watering needed in your area.
- Set sprinklers to water the lawn or garden only—not the street or sidewalk.
- Use soaker hoses and trickle irrigation systems.
- Install moisture sensors on sprinkler systems.

### **Planting:**

- Have your soil tested for nutrient content and add organic matter if needed. Good soil absorbs and retains water better.
- Minimize turf areas and use native grasses.
- Use native plants in your landscape—they require less care and water than ornamental varieties.
- Add compost or peat moss to soil to improve its water-holding capacity.

### **Maintaining:**

- Use mulch around shrubs and garden plants to reduce evaporation from the soil surface and cut down on weed growth.
- Remove thatch and aerate turf to encourage movement of water to the root zone.
- Raise your lawn mower cutting height to cut grass no shorter than three inches—longer grass blades encourages deeper roots, help shade soil, cut down on evaporation, and inhibit weed growth.
- Minimize or eliminate fertilizing which requires additional watering, and promotes new growth which will also need additional watering.

### **Ornamental Water Features:**

- Do not install or use ornamental water features unless they recycle the water. Use signs to indicate that water is recycled. Do not operate during a drought.

**APPENDIX C**  
**END-USER WATER SAVINGS**

Here are just a few of the end-user water savings that could be realized:

### **Leaky Faucets**

**Issue:** Leaky faucets that drip at the rate of one drip per second can waste more than 3,000 gallons of water each year.

**Fix:** If you're unsure whether you have a leak, read your water meter before and after a two-hour period when no water is being used. If the meter does not read exactly the same, you probably have a leak.

### **Leaky Toilets**

**Issue:** A leaky toilet can waste about 200 gallons of water every day.

**Fix:** To tell if your toilet has a leak, place a drop of food coloring in the tank; if the color shows in the bowl without flushing, you have a leak.

### **Showering**

**Issue:** A full bath tub requires about 70 gallons of water, while taking a five-minute shower uses 10 to 25 gallons.

**Fix:** If you take a bath, stopper the drain immediately and adjust the temperature as you fill the tub.

### **Brushing Teeth Wisely**

**Issue:** The average bathroom faucet flows at a rate of two gallons per minute.

**Fix:** Turning off the tap while brushing your teeth in the morning and at bedtime can save up to 8 gallons of water per day, which equals 240 gallons a month!

### **Watering Wisely**

**Issue:** The typical single-family suburban household uses at least 30 percent of their water outdoors for irrigation. Some experts estimate that more than 50 percent of landscape water use goes to waste due to evaporation or runoff caused by overwatering.

**Fix:** Drip irrigation systems use between 20 to 50 percent less water than conventional in-ground sprinkler systems. They are also much more efficient than conventional sprinklers because no water is lost to wind, runoff, and evaporation. If the in-ground system uses 100,000 gallons annually, you could potentially save more than 200,000 gallons over the lifetime of a drip irrigation system should you choose to install it. That adds up to savings of at least \$1,150!

### **Washing Wisely**

**Issue:** The average washing machine uses about 41 gallons of water per load.

**Fix:** High-efficiency washing machines use less than 28 gallons of water per load. To achieve even greater savings, wash only full loads of laundry or use the appropriate load size selection on the washing machine.

### **Flushing Wisely**

**Issue:** If your toilet is from 1992 or earlier, you probably have an inefficient model that uses at least 3.5 gallons per flush.

**Fix:** New and improved high-efficiency models use less than 1.3 gallons per flush—that's at least 60 percent less than their older, less efficient counterparts. Compared to a 3.5 gallons per flush toilet, a WaterSense labeled toilet could save a family of four more than \$90 annually on their water bill, and \$2,000 over the lifetime of the toilet.

### **Dish Washing Wisely**

**Issue:** Running dishwasher partial full and pre-rinsing dishes before loading the dishwasher.

**Fix:** Run the dishwasher only when it's full and use the rinse-and-hold dishwasher feature until you're ready to run a full load. Pre-rinsing dishes does not improve cleaning and skipping this step can save you as much as 20 gallons per load, or 6,500 gallons per year. New water-saver dishwashers use only about 4 gallons per wash.

Estimated water savings from EPA Water Conservation Guidelines 1998 (Appendix B, Table B-1):

Type	Estimated Usage (gpcpd)	Conservation Usage (gpcpd)	Savings (gpcpd)	Savings (%)
Toilet	18.3	10.4	7.9	43 %
Clothes Washers	14.9	10.5	4.4	30 %
Showers	12.2	10.0	2.2	18 %
Faucets	10.3	10.0	.3	3 %
Leaks	6.6	1.5	5.1	77 %

Benchmarks from selected conservation measures from EPA Water Conservation Guidelines 1998 (Appendix B, Table B-4):

Category	Measure	Reduction of End Use (% or gpcpd)
Universal metering	Connection metering	20 %
	Sub metering	20 – 40 %
Costing and pricing	10% increase in residential prices	2 – 4 %
	10% increase in non-residential prices	5 – 8 %
	Increasing-block rate	5 %
Information and education	Public education and behavior changes	2 – 5 %
End-use audits	General industrial water conservation	10 – 20 %
	Outdoor residential use	5 – 10 %
	Large landscape water audit	10 – 20 %
Retrofits	Toilet tank displacement devices (for toilets using > 3.5 gallons/flush)	2 – 3 gpcpd
	Toilet retrofit	8 – 14 gpcpd
	Showerhead retrofit (aerator)	4 gpcpd
	Faucet retrofit (aerator)	5 gpcpd
	Fixture leak repair	0.5 gpcpd
	Governmental building (indoors)	5 %
	Pressure reduction, system	3 – 6 % of total production
Pressure management	Pressure-reducing valves, residential	5 – 30%
	Low water-use plants	7.5 %
	Lawn watering guides	15 – 20 %
	Large landscape management	10 – 25%
	Irrigation timer	10 gpcpd
Replacements and promotions	Toilet replacement, residential	16 – 20 gpcpd
	Toilet replacement, commercial	16 – 20 gpcpd
	Showerhead replacement	8.1 gpcpd
	Faucet replacement	6.4 gpcpd
	Clothes washers, residential	4 – 12 gpcpd
	Dishwashers, residential	1 gpcpd
	Hot water demand units	10 gpcpd
Water-use regulation	Landscape requirements for new developments	10 – 20 % in sector
	Greywater reuse, residential	20 – 30 gpcpd